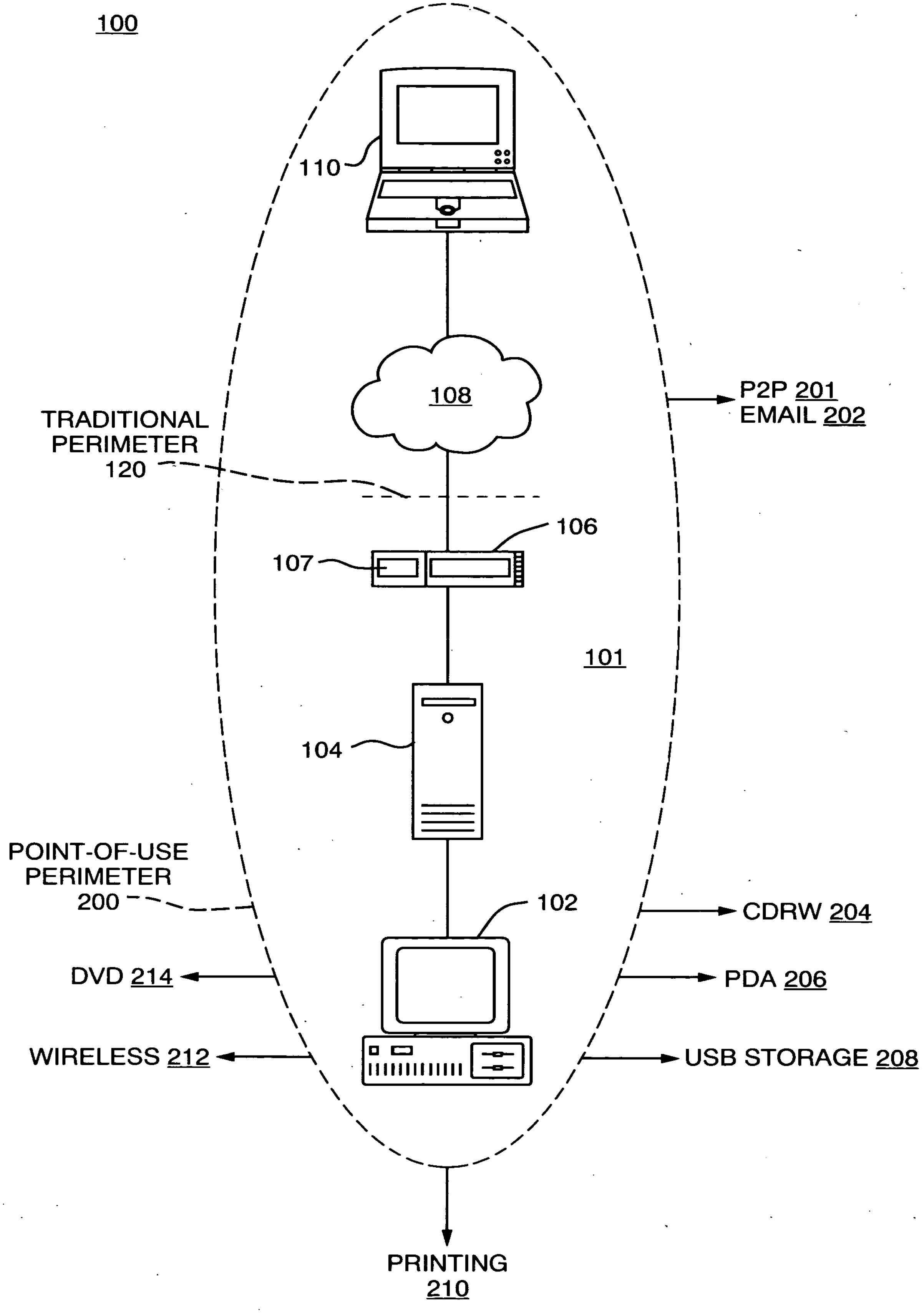

100
110
108
TRADITIONAL PERIMETER 120
106
107
101
104
POINT-OF-USE PERIMETER 200
102
P2P 201
EMAIL 202
CDRW 204
PDA 206
USB STORAGE 208
DVD 214
WIRELESS 212
PRINTING 210

FIG. 1

Application No.: 10/716,336
Title: Digital Asset Usage...
Inventors: Nicholas Stamos, *et al.*
Replacement Sheet

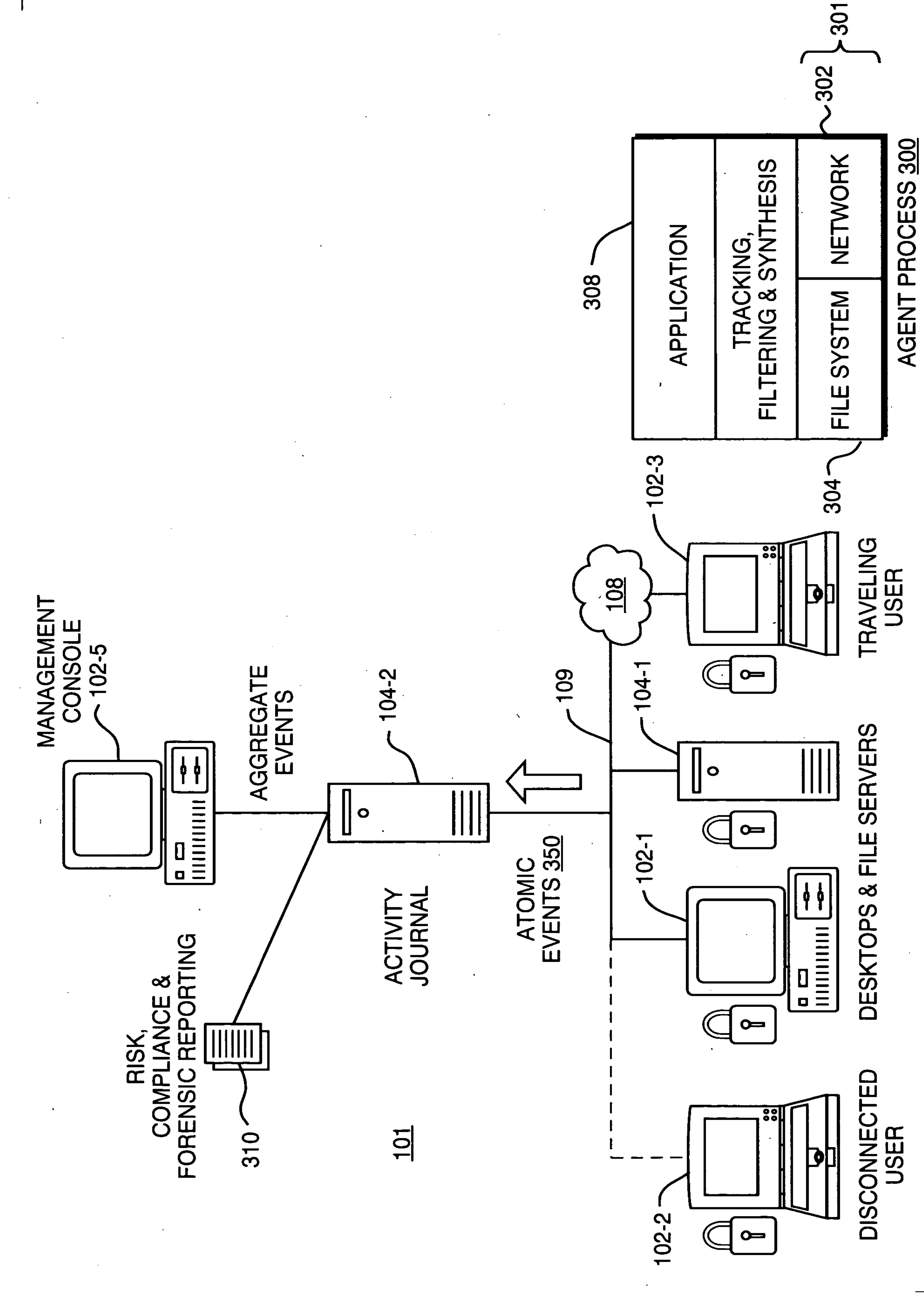


FIG. 2

Application No.: 10/716,336
Title: Digital Asset Usage...
Inventors: Nicholas Stamos, *et al.*
Replacement Sheet

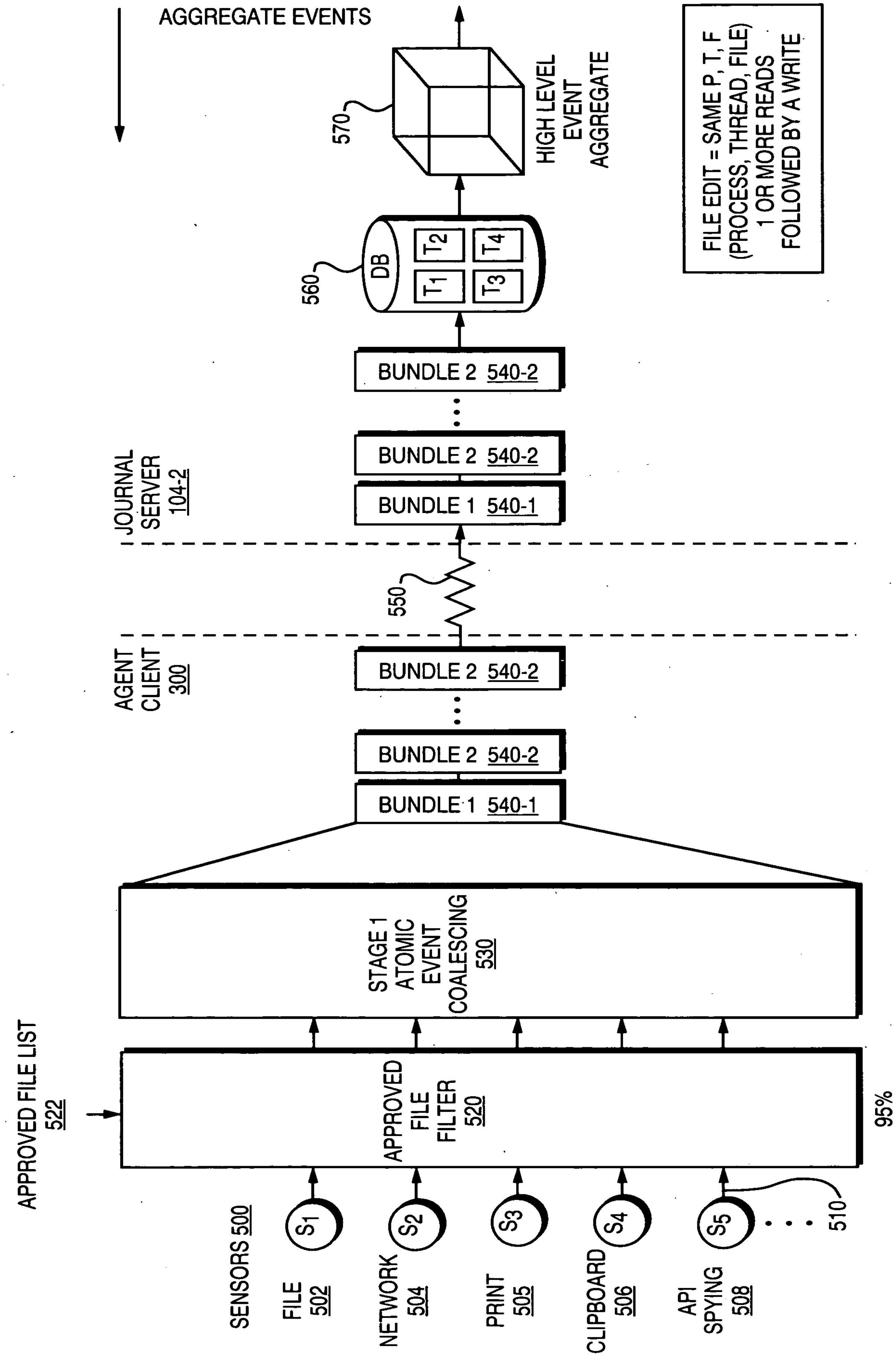


FIG. 3

Action Type	Level	Event Category	Event Name	Event Table	Action Detail Field	Action Detail Value	Discriminant
1	Low	File	FileRead	FileEvent	operationType	0	bytesRead > 0, bytesWritten = 0
2	Low	File	FileWnte	FileEvent	operationType	0	bytesRead = 0, bytesWritten > 0
3	Low	File	FileReadWrite	FileEvent	operationType	0	bytesRead > 0, bytesWritten > 0
4	Low	File	FileCopy	FileEvent	operationType	1	
5	Low	File	FileRename	FileEvent	operationType	2	
6	Low	File	FileDelete	FileEvent	operationType	3	
7	Low	File	FileMove	FileEvent	operationType	4	
8	Low	File	FileRecycle	FileEvent	operationType	5	
9	Low	File	FileRestore	FileEvent	operationType	6	
10	Low	Network	TCPIPInbound	NetworkEvent	protocolType	TCPIP	isOutbound = 0
11	Low	Network	TCPIPOutbound	NetworkEvent	protocolType	TCPIP	isOutbound = 1
12	Low	Network	UDPInbound	NetworkEvent	protocolType	UDP	isOutbound = 0
13	Low	Network	UDPOutbound	NetworkEvent	protocolType	UDP	isOutbound = 1
14	Low	Network	IPSECInbound	NetworkEvent	protocolType	IPSEC	isOutbound = 0
15	Low	Network	IPSECOutbound	NetworkEvent	protocolType	IPSEC	isOutbound = 1
16	Low	Print	Print	PrintEvent	(implied)	N/A	
17	Low	CD	CDRead	CDEvent	operationType	1	
18	Low	CD	CDWrite	CDEvent	operationType	2	
19	Low	Clipboard	ClipboardCutCopy	ClipboardEvent	eventType	CutCopy	
20	Low	Clipboard	ClipboardPaste	ClipboardEvent	eventType	Paste	
21	Low	User	UserLogon	UserEvent	eventType	Logon	
22	Low	User	UserLogoff	UserEvent	eventType	Logoff	
23	Low	Machine	Machine	MachineEvent	eventType	• • •	Skip the Machine events

FIG. 4A

24	Low	Process	ProcessStart	Process	(Implied)		Use processStartDtTm
25	Low	Process	ProcessEnd	Process	(Implied)		Use processEndDtTime
26	High	File	FileEdited	AggregateEvent			
27	High	File	FileCopied	AggregateEvent			
28	High	File	FileSaveAs	AggregateEvent			
29	High	File	FileLeftThroughRemovableMedia	AggregateEvent			
30	High	Clipboard	ClipboardToFile	AggregateEvent			
31	High	Print	PrintFile	AggregateEvent			
32	High	CD	BurnMaster	AggregateEvent			
33	High	CD	BurnFile	AggregateEvent			
34	High	Network	FileLeftThroughNetworkPort	AggregateEvent			
35	High	Network	EmailFile	AggregateEvent			
36	High	Network	RemoteAccess	AggregateEvent			
37	High	Network	InstantMessenger	AggregateEvent			
38	High	Network	P2PApp	AggregateEvent			
39	High	Network	FTPFile	AggregateEvent			
40	High	Network	TunnelOut	AggregateEvent			
41	High	Network	TunnelIn	AggregateEvent			
42	High	Network	TunnelInOut	AggregateEvent			
43	High	Network	FileOutThroughTunnel	AggregateEvent			

FIG. 4B

Event Name	Constituent Event Types	Pattern	Scope
FileEdited	FileRead, FileWrite, FileReadWrite	Same processid and fileHandle. beforeHash of first read & afterHash of last write differ. Both reads and writes to same fileHandle. Sum of writes > 0.	Thread
FileCopied	FileRead, FileWrite, FileReadWrite, FileCopy	Command shell: Alternating reads & writes. The reads all have one filehandle, the writes all have a second one. Explorer: A long series of reads from one filehandle followed by a long series of writes to a second. Miind the time period between. In both cases, the target device must not be removable.	Thread
FileSaveAs	FileRead, FileWrite, FileReadWrite	An app reads one or more files then writes a file.	Process
FileLeftThroughRemovableMedia	FileRead, FileWrite, FileReadWrite, FileCopy	Same as FileCopied or FileSaveAs, but target device is removable.	Process
ClipboardToFile	ClipboardCutCopy, ClipboardPaste	Pair a ClipboardCutCopy with all subsequent Clipboard Paste events for that user login until the next copy or the user logs out. Problem: If the user closes the application that performed the copy and the object was large and the user opts not to keep it there, what happens ?	Login

FIG. 5A

PrintFile	Print, possibly others	Unclear. If there are temp files, intermediate PDF files, etc. then we may perform a chain of custody analysis to figure out just what was printed.	Thread
BurnMaster	FileRead, FileWrite	An app known to burn files reads one or more files then writes a file.	Process
BurnFile	CDWrite, FileRead	Application is recognized as a CD writing app. (Optional) Series of FileReads from one fileHandle, followed by a series of CDWrite events with the same process. May need to compare filenames, otherwise one read will exhaust all the writes. Alternately, all read files are lumped together with one large burn event. Or perhaps the first read of a new file after the last read from the previous file is the start of the next burn event.	Process
FileLeftThroughNetworkPort	FileRead, TCPIPInbound, TCPIPOutbound, UDPInbound, UDPOutbound, IPSECInbound, IPSECOutbound	An overlapping stream of FileReads interspersed with Inbound and Outbound network events. All the network events should be for the same port (?) and to a destination NOT on localhost. All the network events should be for the same protocol.	Thread
EMailFile	FileRead, TCPIPInbound, TCPIPOutbound, (other protocols???)	Similar to FileLeftThroughNetworkPort. Combines all interleaving FileReads with the network events. The application image name is one of those known to be an email program. May place constraints on the ports, since many emailers use certain well defined ports for SMTP, POP, etc.	Process

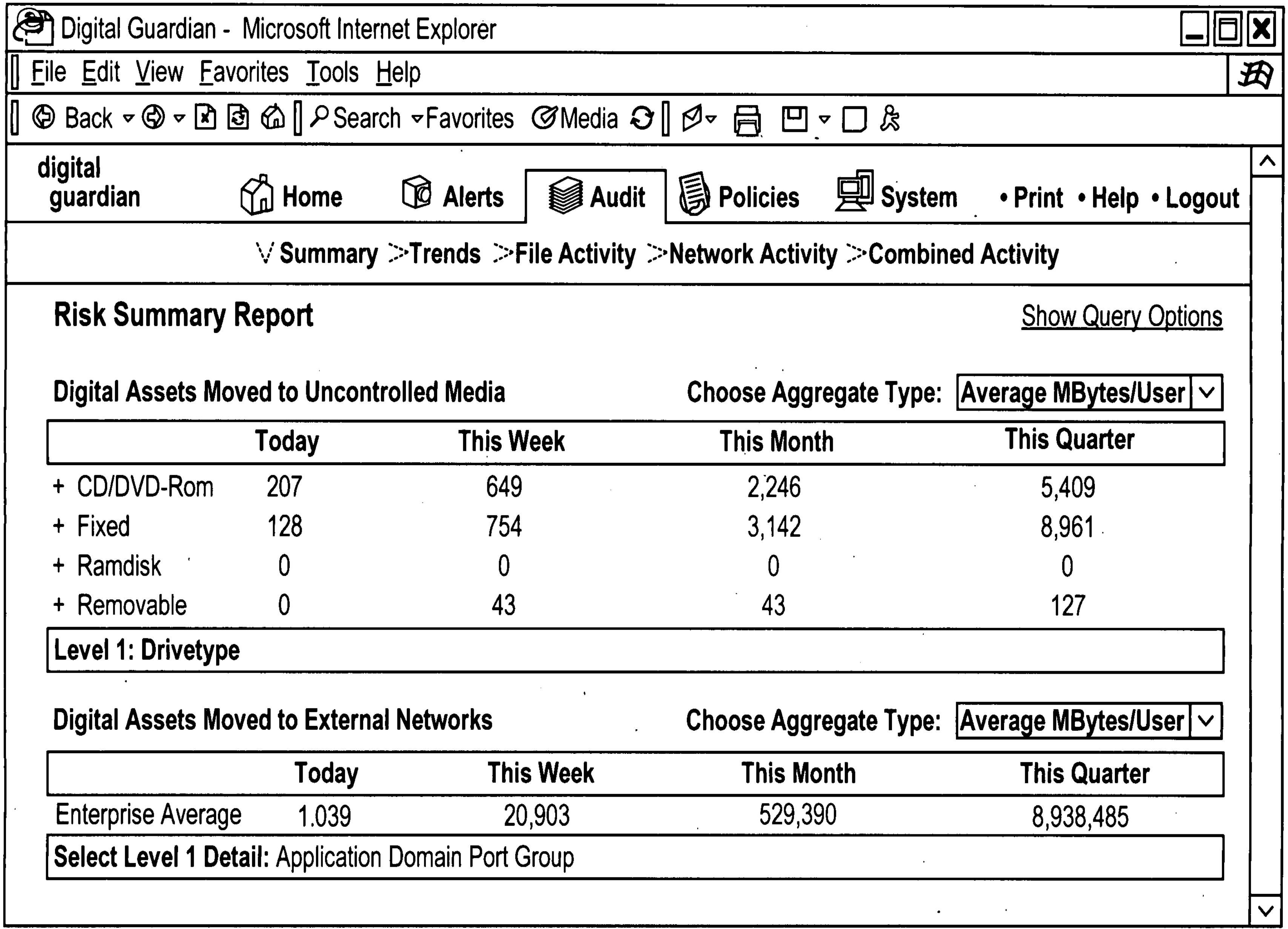
FIG. 5B

InstantMessenger	FileRead, TCPIPInbound, TCPIPOutbound, (other protocols???)	Similar to FileLeftThroughNetworkPort. Combines all interleaving FileReads with the network events. The application image name is one of those known to be used for instant Messanger. May place constraints on the ports.	Process
P2PApp	FileRead, TCPIPInbound, TCPIPOutbound, UDPInbound, UDPOutbound, IPSECInbound, IPSECOutbound	Constrain the application name to be one of those known to be a P2PApp. Multiple ports will be used; some or all of them may have constraints. May constrain the protocol per app or per instance. Similar to FileLeftThroughNetworkPort as concerns interleaved file reads.	Process
FTPFile	FileRead, FileWrite, ??? (TCPIPInbound, TCPIPOutbound	May want to split into two events, one for reading and one for writing. Constrain to the common FTP port, unless the app is known by name to be an FTP client. Like FileLeftThroughNetworkPort, look for interleaved reads and network events, or interleaved writes and network events.	Process
RemoteAccess	TCPIPInbound, TCPIPOutbound, UDPInbound, UDPOutbound, IPSECInbound, IPSECOutbound	Do not incorporate FileRead events. Several ports may be used. Look for known image names of remote apps.	Process

FIG. 5C

TunnelOut	TCPIPInbound, TCPIPOutbound, UDPInbound, UDPOutbound, IPSECInbound, IPSECOutbound	All events use same protocol. Only two processes used. Two different apps and four ports are used. One of the ports is remote. Event 1: The first app sends outbound from local port 1 to local port 2. Event 2: The second app (the tunneler) receives inbound from local port 1 to local port 2. Event 3: The tunneler also sends from local port 3 to remote port 4. Both events of the tunneler share the same thread (probably).	Login
TunnelIn	TCPIPInbound, TCPIPOutbound, UDPInbound, UDPOutbound, IPSECInbound, IPSECOutbound	All events use same protocol. Only two processes used. Two different apps and four ports are used. one of the ports is remote. Event 1: The first app (the tunneler) receives inbound from remote port 1 to local port 2. Event 2: The tunneler sends outbound from local port 2 to local port 3. Event 3: The second app also receives inbound from local port 3 to local port 4. Both events of the tunneler share the same thread (probably).	Login
TunnelInOut	TCPIPInbound, TCPIPOutbound, UDPInbound, UDPOutbound, IPSECInbound, IPSECOutbound	Multiple protocols may be used. More research needed. More than three ports are used.	Login
FileLeftThroughTunnel	FileRead, TunnelOut	Similar to FileLeftThroughNetworkPort. Combines all interleaving FileReads involving a process that is participating in a TunnelOut event. If more than one file is read, the source destination will be a count of the files read.	Login?

FIG. 5D



Digital Guardian - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
digital guardian
Home
Alerts
Audit
Policies
System
• Print • Help • Logout
∨ Summary >Trends >File Activity >Network Activity >Combined Activity
Show Query Options

Risk Summary Report

Digital Assets Moved to Uncontrolled Media

Choose Aggregate Type: Average MBytes/User ∨

	Today	This Week	This Month	This Quarter
+ CD/DVD-Rom	207	649	2,246	5,409
+ Fixed	128	754	3,142	8,961
+ Ramdisk	0	0	0	0
+ Removable	0	43	43	127

Level 1: Drivetype

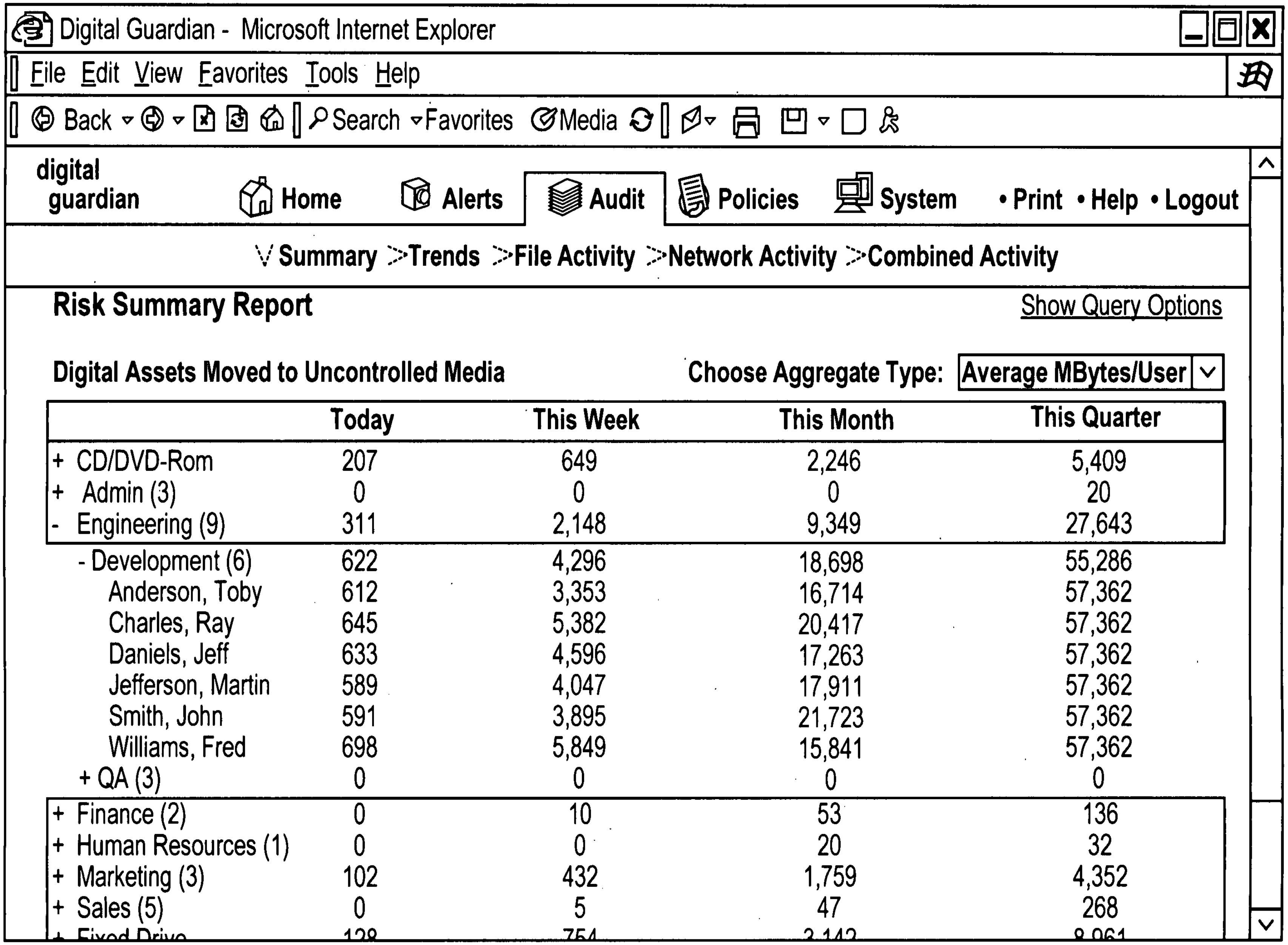
Digital Assets Moved to External Networks

Choose Aggregate Type: Average MBytes/User ∨

	Today	This Week	This Month	This Quarter
Enterprise Average	1.039	20,903	529,390	8,938,485

Select Level 1 Detail: Application Domain Port Group

FIG. 6A


Digital Guardian - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
digital guardian
Home
Alerts
Audit
Policies
System
• Print • Help • Logout
∨ Summary > Trends > File Activity > Network Activity > Combined Activity

Risk Summary Report

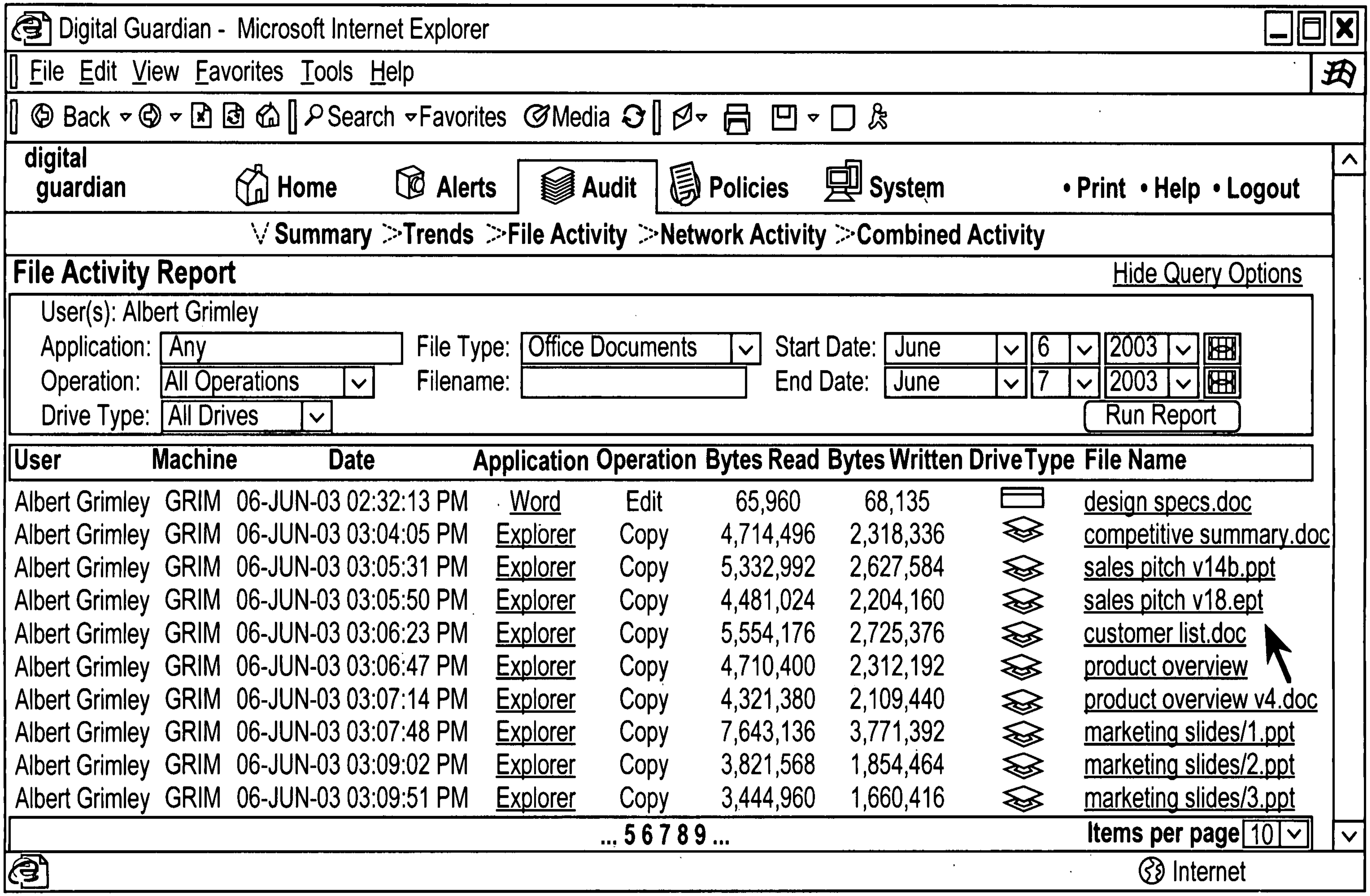
Show Query Options

Digital Assets Moved to Uncontrolled Media

Choose Aggregate Type: Average MBytes/User

	Today	This Week	This Month	This Quarter
+ CD/DVD-Rom	207	649	2,246	5,409
+ Admin (3)	0	0	0	20
- Engineering (9)	311	2,148	9,349	27,643
- Development (6)	622	4,296	18,698	55,286
Anderson, Toby	612	3,353	16,714	57,362
Charles, Ray	645	5,382	20,417	57,362
Daniels, Jeff	633	4,596	17,263	57,362
Jefferson, Martin	589	4,047	17,911	57,362
Smith, John	591	3,895	21,723	57,362
Williams, Fred	698	5,849	15,841	57,362
+ QA (3)	0	0	0	0
+ Finance (2)	0	10	53	136
+ Human Resources (1)	0	0	20	32
+ Marketing (3)	102	432	1,759	4,352
+ Sales (5)	0	5	47	268
+ Fixed Drive	128	754	2,142	8,061

FIG. 6B


Digital Guardian - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
digital guardian
Home
Alerts
Audit
Policies
System
• Print • Help • Logout
Summary >Trends >File Activity >Network Activity >Combined Activity
Hide Query Options
Run Report
Internet

File Activity Report

User(s): Albert Grimley
Application: Any
Operation: All Operations
Drive Type: All Drives
File Type: Office Documents
Filename:
Start Date: June 6 2003
End Date: June 7 2003

User	Machine	Date	Application	Operation	Bytes Read	Bytes Written	DriveType	File Name
Albert Grimley	GRIM	06-JUN-03 02:32:13 PM	Word	Edit	65,960	68,135	▭	design specs.doc
Albert Grimley	GRIM	06-JUN-03 03:04:05 PM	Explorer	Copy	4,714,496	2,318,336	≋	competitive summary.doc
Albert Grimley	GRIM	06-JUN-03 03:05:31 PM	Explorer	Copy	5,332,992	2,627,584	≋	sales pitch v14b.ppt
Albert Grimley	GRIM	06-JUN-03 03:05:50 PM	Explorer	Copy	4,481,024	2,204,160	≋	sales pitch v18.ept
Albert Grimley	GRIM	06-JUN-03 03:06:23 PM	Explorer	Copy	5,554,176	2,725,376	≋	customer list.doc
Albert Grimley	GRIM	06-JUN-03 03:06:47 PM	Explorer	Copy	4,710,400	2,312,192	≋	product overview
Albert Grimley	GRIM	06-JUN-03 03:07:14 PM	Explorer	Copy	4,321,380	2,109,440	≋	product overview v4.doc
Albert Grimley	GRIM	06-JUN-03 03:07:48 PM	Explorer	Copy	7,643,136	3,771,392	≋	marketing slides/1.ppt
Albert Grimley	GRIM	06-JUN-03 03:09:02 PM	Explorer	Copy	3,821,568	1,854,464	≋	marketing slides/2.ppt
Albert Grimley	GRIM	06-JUN-03 03:09:51 PM	Explorer	Copy	3,444,960	1,660,416	≋	marketing slides/3.ppt

... 5 6 7 8 9 ...

Items per page 10

FIG. 6C